

### REMARKS

Applicants respectfully request reconsideration of the application, as amended, in view of the following remarks.

The present invention as set forth in **Claim 1** relates to an electrophotographic photoreceptor, comprising:

an electroconductive substrate,

on the electroconductive substrate, an intermediate layer comprising titanium oxide,

and

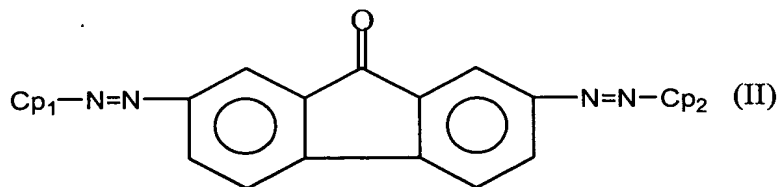
a photosensitive layer on the intermediate layer,

wherein the photosensitive layer comprises:

a charge generation layer, and

a charge transport layer,

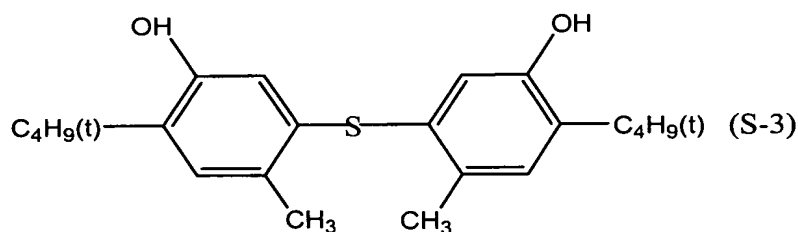
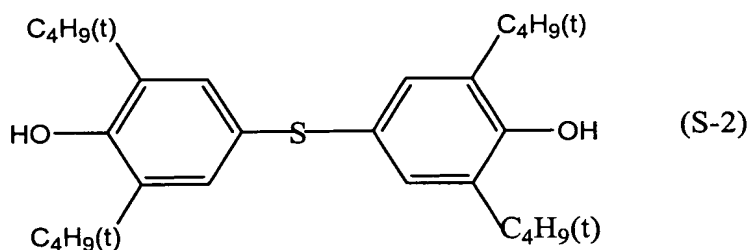
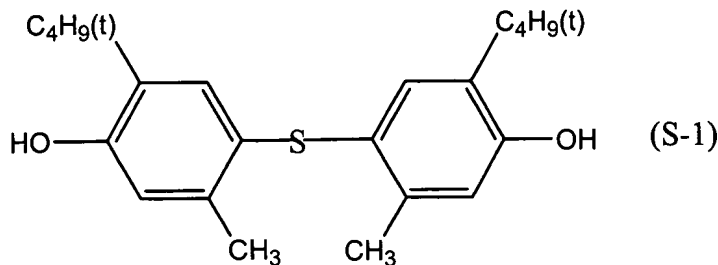
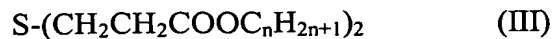
wherein the charge generation layer comprises, as charge generation materials which have spectral sensitivity in differing wavelength regions, at least one phthalocyanine pigment and at least one asymmetric bisazo pigment having the following formula (II):



wherein  $\text{Cp}_1$  and  $\text{Cp}_2$  each, independently, represent a residual group of a coupler, wherein  $\text{Cp}_1$  is different from  $\text{Cp}_2$ ;

wherein the phthalocyanine pigment and the asymmetric bisazo pigment are present in the photosensitive layer in a ratio of 1:5 to 5:1 by weight;

and wherein the charge transport layer comprises an organic sulfur-containing compound selected from the group consisting of compounds having the following formulas III, S-1, S-2 and S-3:



wherein n is an integer of from 8 to 25.

The rejections based on the combination of JP '998 and JP '250, and further combined with Kanoto, Kakuta, DERWENT Abstract '039 set out in Official Action paragraphs 5-8 are traversed.

The claims are limited to a particular subgenus of asymmetric bisazo pigments and an intermediate layer comprising titanium oxide. Neither of these limitations are disclosed anywhere in JP '250.

The JP '998 reference is deficient because it does not teach the particular sulfur-containing antioxidant required by the claims. The JP '998 reference does disclose however that it is possible to have an interlayer between the conductive base material and the photosensitive layer, and this interlayer may include titanium oxide. See, e.g., paragraph

[0030] in JP '998. JP '998 also discloses asymmetric bisazo pigments (compounds (I) - 24 and (I) - 29) and  $\tau$ -type non-metal phthalocyanine compounds at paragraph [0035] for example. Thus, JP '998 is the closest prior art, but it nevertheless lacks any teaching of the claimed sulfur-containing antioxidant.

Applicants discussed a comparison using the JP '998 photoconductors in the response filed June 4, 2003. In the Office Action of August 27, 2003, the Examiner argues that "the comparative examples in the instant specification are not probative comparisons to JP '998." (Office Action page 16, lines 13-15). Specifically, the Examiner argues that "the specification is not commensurate in scope with the instant claims." (Office Action, page 13, lines 16 and 17). Further, the Examiner argues that "both the diameter of the photoreceptor drum and the thickness of the underlayer appear to be critical elements to formation of black spots." (Office Action, page 15, lines 13-16). In order to address the Examiner's argument, Applicants provide herewith a Rule 132 Declaration showing that the present invention is independent of the thickness of the intermediate layer and the drum diameter. Applicants have repeated Example 5 and Comparative Example 5 of the present application to show that the present invention does not depend on the thickness of the intermediate layer and the drum diameter. The intermediate layer thickness and the drum diameter were changed to 4.5  $\mu\text{m}$  and 80 mm, respectively. The Examiner's attention is directed to **points 4.1 to 4.3 of the Declaration.**

**Examples A, B and C** in each of which **an organic sulfur-containing antioxidant was included**, and a photoconductor of **Comparative Example A** in which **no organic sulfur-containing antioxidant was included**, were prepared. The light resistance and image quality were determined. The results are summarized in the Table A below which is copied from the Rule 132 Declaration.

The results are shown in Table A.

Table A

	Drum diameter (mm)	Intermediate layer thickness ( $\mu\text{m}$ )	$\Delta\text{VD}$ (V)	Black spots observed from Copy #	Undesired Images
Ex. 4 (from page 43 of application)	30	3	80	45,000	no
Ex. 5 (from page 46 of application)	30	3	50	0	no
Ex. A	80	4.5	50	173,000	No
Ex. B	80	4.5	20	0	No
Ex. C	80	4.5	20	0	No
Comp. Ex. A	80	4.5	95	105,000	Background fouling

As can be understood from Table A, it is clear that the photoconductor of the present invention is superior to the comparative photoconductor. Further, it has been demonstrated that this superior result is achieved independent of the drum diameter and the intermediate layer thickness. For comparison the data for Examples 4 and 5 of the specification using a drum diameter of 30 mm and a thickness of the intermediate layer of  $3\mu\text{m}$  are shown in the Table A. In addition, Examples A, B and C are superior to Comparative Example A which uses the photoreceptor of JP'998 (JP '998 compound (I)-24 which is Formula (VII) of the present invention). Notably, background fouling occurs in Comparative Example A and black spots appear after 105,000 copies.

The unexpected superior results are not disclosed or suggested by JP '998 or any other cited reference. This is clear evidence of the unobviousness of the present invention, and Applicants kindly request that the rejections based on JP '998 combined with JP '250 and further combined with Kanoto, Kakuta, DERWENT Abstract '039, set out in Official Action paragraphs 5-8, be withdrawn.

The rejections based on the combination of JP '890 and JP '250, and further combined with Kanoto, and U.S. 3,357,989 (Byrne), set out in Official Action paragraphs 10-13, are traversed.

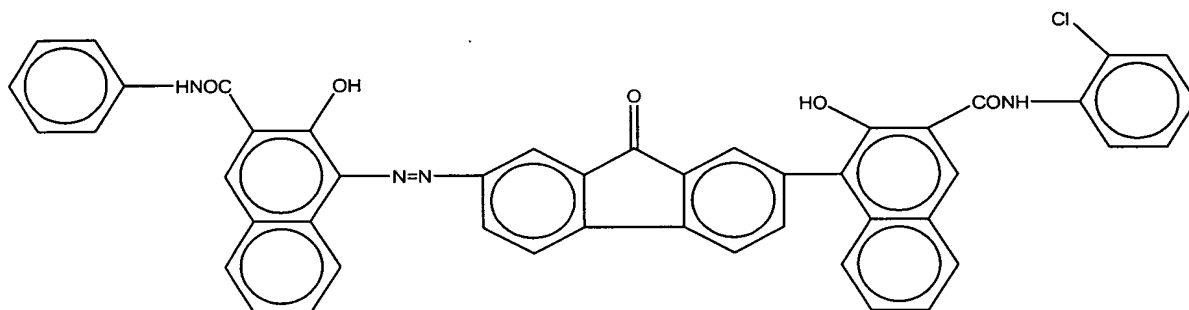
JP '890 fails to disclose or suggest a sulfur-containing antioxidant as claimed. In addition, the photoconductor of Example 8 of JP'890 (JP'890 compound (I)-24 which corresponds to formula (VII) of the present invention) and the phthalocyanine pigment (X-form phthalocyanine) are used in Example 9 of the present invention. Example 9 which according to the present invention also contains a sulfur-containing antioxidant, has superior properties as shown in Table 16 at page 46 of the specification. Notably, black spots and undesired images are not observed. The compound of Example 9 of JP'890 (JP'890 compound (I)-29 which corresponds to formula (VIII) of the present invention) is used in Comparative Examples 13-16 formula which show black spots (and background fouling in case of Comparative Example 13). In addition, Applicants provide in the Rule 132 Declaration data for a combination of compound (VIII) and X-form phthalocyanine; and data using a photoconductor as in Example 10 of JP'890 (JP'890 compound (I)-30) in combination with X-form metal free phthalocyanine pigment.

The Examiner's attention is directed to points 5.1 to 5.3 of the Declaration. The results are summarized in Table B below.

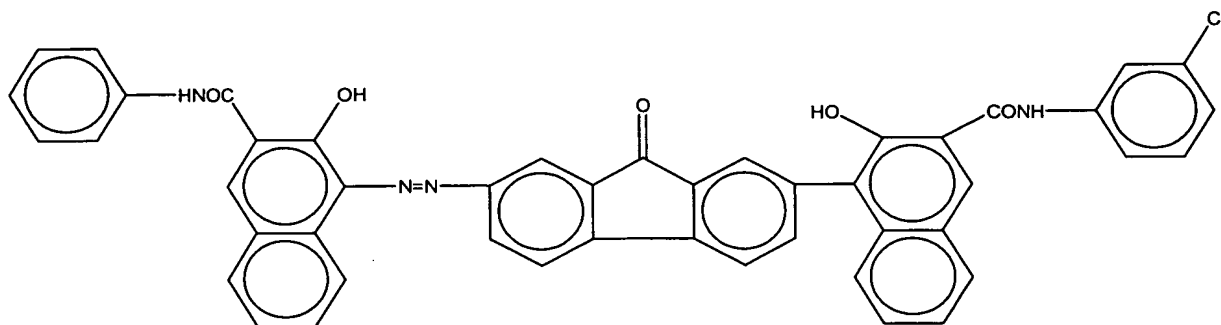
Table B

	Asymmetric disazo pigment	Additive	$\Delta$ VD	Black spots observed from Copy #	Undesired images
Example D	Formula (VIII)*	(III)-3	20	0	No
Example E	Formula (VIII)*	(III)-5	20	0	No
Example F	Formula (VIII)*	(III)-6	20	0	No
Example G	Formula A**	(III)-3	15	0	No
Example H	Formula A**	(III)-5	20	0	No
Example J	Formula A**	(III)-6	20	0	No
Comp. Ex. B	Formula (VIII)*	No	105	36,000	Background fouling
Comp. Ex. C	Formula (VIII)*	(1)* <sup>3</sup>	90	40,000	No
Comp. Ex. D	Formula (VIII)*	(2)* <sup>4</sup>	95	39,000	No
Comp. Ex. E	Formula (VIII)*	(3)* <sup>5</sup>	105	36,000	No
Comp. Ex. F	Formula A**	No	100	36,000	Background fouling
Comp. Ex. G	Formula A**	(1)* <sup>3</sup>	90	39,000	No
Comp. Ex. H	Formula A**	(2)* <sup>4</sup>	90	38,000	No
Comp. Ex. J	Formula A**	(3)* <sup>5</sup>	100	36,000	No

\*Formula (VIII) (same as (I)-29 in JP '890)



\*\*Formula (A) (same as (I)-30 in JP '890)



\*3: 2,6-di-tert-butyl-p-cresol

\*4: 4,4'-butylidenebis-(6-tert-butyl-3-methylphenol)

\*5: tris(2,4-di-tert-butylphenyl)phosphite

The Examples according to the present invention that use 1) a combination of the compound VIII with X-form metal-free phthalocyanine and a sulfur-containing antioxidant or 2) a combination of compound (I)-30 used in Example 10 of JP '890 with X-form metal-free phthalocyanine and a sulfur-containing antioxidant do not exhibit black spots or undesired images (Examples D-F and G-J). In contrast, if no sulfur-containing antioxidant is used, black spots and undesired images occur (Comparative Examples B and F). If other additives are used, the superior properties of the present invention cannot be achieved (Comparative Examples C-E and G-J). Thus, the superior results of the present invention have been demonstrated.

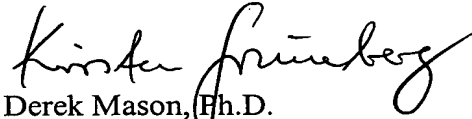
These superior results are not disclosed or suggested by JP '890, JP '250, Kanoto, or U.S. 3,357,989 (Byrne), alone or in combination.

Applicants kindly request that the rejections based on JP '890 and JP '250, and further combined with Kanoto, and U.S. 3,357,989 (Byrne), set out in Official Action paragraphs 10-13, be withdrawn.

Applicants submit that the present application is now in condition for allowance and early notice of such action is earnestly solicited.

Respectfully submitted,

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